

REMARKS

Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

By this Amendment, claims 1 and 5 and the specification are amended and claim 6 is newly added. The specification is amended for the purpose of adding the foreign priority information. Support for the amendment to claim 1 may be found, for example, in the embodiment discussed in paragraph 21 of the present patent application. No new matter has been added. Accordingly, after entry of this Amendment, claims 1-6 will remain pending in the patent application.

Claims 1-5 were rejected under 35 U.S.C. §103(a) based on Seo, S.R. (Korean Application No. 2001-001224A) in view of Yagi (U.S. Pat. No. 5,899,792). The rejection is respectfully traversed.

Claim 1 recites a method for inspecting an insulating layer deposited or planarized on a substrate in fabrication processes of semiconductors with a library of optic images, the method comprising, *inter alia*, collecting standard data for thickness of the insulating layer. As conceded by the Examiner, Seo does not disclose, teach or suggest these features. However, Applicant respectfully submits that there are additional features that are absent in Seo.

For example, Seo does not disclose, teach or suggest a method for inspecting an insulating layer deposited or planarized on a substrate in fabrication processes of semiconductors with a library of optic images, the method comprising, *inter alia*, making a library by matching standard data for the thickness and the optic image collected on a same location on the substrate.

Seo discloses a method and a device for inspecting error in a wafer. (*See, e.g.*, lines 1-2 of the Abstract of Seo). The device includes a light source 10 that irradiates the surface of the wafer 14 and an image pickup means for collecting the reflected light and providing a color image. (*See, e.g.*, lines 6-14 of the Abstract of Seo). The detected color image is then compared to a reference color image included in a database. (*See, e.g.*, lines 19-28 of the Abstract of Seo). The database includes the thickness and material that are associated with the reference color image. *Id.*

However, unlike claim 1, Seo is silent as to matching standard data for the thickness and the optic image collected on a same location on the substrate. In particular, there are no teachings or suggestions in Seo as to matching the color image of a particular location of the

substrate with the thickness of the thin film of that particular location. Seo merely discloses a database that associates the color image of the substrate with the theoretical or average thickness of the film deposited on the wafer. However, the association of the color image and the theoretical or average thickness of the film is done without regard to the particular location on the substrate where the measurements of the color image and the thickness are performed. As such, Seo does not create a library in which the color image of a particular location of the substrate is matched with the thickness of the thin film of that particular location.

Yagi fails to remedy the deficiencies of Seo. Yagi merely relates to an optical polishing apparatus that includes an endpoint detector device that measures the thickness of a film that is being polished. (*See, e.g.*, col. 2, lines 38-53 of Yagi). However, Yagi is silent as to matching standard data for the thickness and the optic image collected on a same location on the substrate. Accordingly, any reasonable combination of Seo and Yagi cannot result, in any way, in the invention of claim 1.

The Examiner alleged that "it would have been obvious to one of ordinary skill in the art ... to inspect the insulating layer of a wafer to ensure that the insulating layer is planar to ensure a lack of dielectric breakdown and low leakage current in the wafer." Applicant respectfully disagrees. Yagi is merely concerned with determining the thickness of the substrate but is not concerned with obtaining optic image data of the polished substrate. Yagi's measurements are merely intended to ensure that the planarization of the insulating layer provides a substantially uniform thickness layer. There is no need in Yagi to use optic image data since Yagi's thickness measurements are done concurrently with the polishing of the wafer surface (*i.e.*, without the possibility of collecting optic image data of the insulating layer since the polishing pad is in contact with the surface of the insulating layer). As such, in the absence of impermissible hindsight based on Applicant's own specification, there is no reason as to why one of ordinary skill in the art would be motivated to combine Seo's teachings in view of Yagi to provide a library in which the color image data of an insulating layer is matched with the thickness data of the insulating layer.

Claims 2-5 are patentable over Seo, Yagi and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-5 under 35 U.S.C. §103(a) based on Seo in view of Yagi are respectfully requested.

Claim 6 is newly added to define additional subject matter that is novel and non-obvious. Claim 6 is patentable over the art of record for at least similar reasons as provided

KANG -- 10/756,770  
Attorney Docket: 025403-0307595

above in claim 1 and for the additional features recited therein. Accordingly, claim 6 is allowable

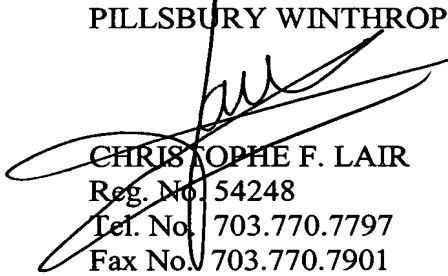
Applicant has addressed the Examiner's rejection and respectfully submits that the application is in condition for allowance. A notice to that effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP



CHRIS TOPHE F. LAIR  
Reg. No. 54248  
Tel. No. 703.770.7797  
Fax No. 703.770.7901

CFL  
P.O. Box 10500  
McLean, VA 22102  
(703) 770-7900